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FURNES.

[Furnes.]

THE ancient town of Furnes in West Flanders is situated on the frontiers of Belgium, about three miles from the sea-coast, and eleven from Dunkirk. It lies on the route very commonly pursued by travellers from Calais or Boulogne to Ostend, Brussels, and other parts of Belgium. Our engraving, from an original sketch, represents the west view of the *Place*, with its very picturesque looking houses, and its Palais de Justice, and behind these the cathedral church of St. Walburgh, all combining, in their general arrangement and harmonious contrasts of outline and colour, to form an attractive picture. The cathedral, which is built of small red bricks, contains many curiosities. In the Palais de Justice are tried all the minor causes and disputes which arise in the surrounding districts, the decisions generally appearing to be so satisfactory to the litigants, that the interference of the superior court at Brussels is scarcely ever desired. Among the houses of the Place are some very remarkable looking ones, built by the Spaniards during the reign of Albert and Isabella, which are still in good preservation, and interesting, apart from their age, for their peculiar elegance of style. The country around Furnes is considered one of the most fertile districts of Belgium; and, which unfortunately is not always a consequence thereof, the inhabitants, who are chiefly farmers, are wealthy. The pastures are peculiarly rich, and produce the very finest butter. Furnes supplies many of the adjacent provinces with corn, and a brisk trade is carried on in other articles of agricultural produce. The town contains tanneries, breweries, ropewalks, salt-refineries, and oil-mills. Its commerce is much facilitated by the canals, a mode of transport peculiarly fitted for so flat a country, and by means of which it freely communicates with every part of Belgium and France. Still there is not so much business done in Furnes as one might expect from the fruitfulness of the soil of the neighbouring lands, and from its general capabilities for trade. Provisions are very cheap; the common price of meat is only five pence per pound, consisting of eighteen ounces, and bread is one-third less in price than with us.

Nearly all the inhabitants profess the Catholic religion. In one of the streets leading out of the Place is a Catholic college, where about sixty students are instructed in the elementary departments of classical literature and mathematics. A Literary and Political Society, at first formed by the professional residents of Furnes, but now including the tradesmen and farmers generally, is conducted with spirit and liberality. Strangers, whose stay does

not exceed six months, are admitted and registered in the books of the institution by members, free of expense, and have free access to the library, with the perusal of several daily papers.

The ancient writers of the country assert that Lyderick, the first forester of Flanders, was the founder of the town of Furnes. The district, at the period of his accession, was in a very wild and uncivilised state, large numbers of its inhabitants living only by plunder and rapine. Lyderick resolved to repress the acts of violence which were being constantly committed on the persons and property of the neighbouring residents, and to teach this lawless people habits of peace, order, and industry. To protect the honest and the laborious, he punished with severity the idle and the dissolute. He built spacious prisons in and near the town, of which various caves and subterranean passages still remain, near the old churchyard at the back of the Palais de Justice. The more effectually to promote his objects, he invited from different parts families well acquainted with the practices of agriculture, to diffuse by their example the knowledge and the habits so necessary for the well-being of his people. In a few years the soil lost its wild and barren appearance, and presented everywhere evidences of the richest fertility. From this event Furnes derives its name, which, called in Flemish Veurne, signifies a furrow: chosen, in all probability, as a significant type of the means by which so important a change had been wrought. According to the same authorities, Furnes, at first close to the sea, was entirely destroyed during the Norman invasion, and rebuilt on its present site, by Baldwin, surnamed the Iron-arm, in the year 869. On the plains of Furnes a battle was fought in 1297, between Count Robert of Artois, who commanded the forces of Philip the Fair, and Count Guy of Flanders, the leader of the English troops on the part of Edward I. Furnes has frequently been in the possession of the French: Louis XV. took it in 1744, and held it till the treaty of Aix-la-Chapelle; and at the beginning of the French Revolution it also passed into their possession, and formed a portion of the department of the Lyz till 1814. Prior to this, the fortifications of Furnes caused it to be looked upon as a place of military importance; since the peace these have been demolished. The town generally is well built, and contained in 1830, 756 houses, 954 families, and 4253 individuals. The roads from Furnes to the neighbouring towns are paved in the centre with small stones of an oblong shape, and have generally rows of trees planted on each side, which are not merely beautiful in themselves as foliage, but tend greatly to relieve the dull monotony of appearance these roads would otherwise exhibit from their general straightness, and the level character of the country they intersect.

HELIOGRAPHY.

The camera obscura is an invention for throwing the images of external objects upon a surface. It is something like a box, with a lens or prism at one end, which conveys a distinct impression of the objects reflected by the glass, in the same manner that objects are painted on the retina of the eye; and they are concentrated on a plain or curved surface, so as to form the most beautiful pictures, preserving the utmost precision of form, and vivid colouring, combined with perfect accuracy of tone. Those who have amused and gratified themselves with the *camera obscura* have often doubtless regretted that the charming landscapes which have excited their admiration could not be preserved in all their beauty and perfection; and although the idea may have seemed hopeless, yet an approximation has been made towards so singular a result by M. Daguerre, a French artist, who has for many years been occupied in studying the nature and properties of light. In order to form some idea of M. Daguerre's discovery, the reader may suppose himself before a looking-glass in which he sees his own face reflected, and, standing fixedly for ten minutes, he finds at the end of that time an ineffaceable impression is left upon the glass, presenting the form and features of his portrait. This comparison presents a familiar notion of the nature of the discovery; but in M. Daguerre's process, the camera obscura is used, and instead of its impressions being fugitive, they are fixed in the minutest details, and with an exactitude and delicacy truly wonderful. It is necessary to state, however, that objects are not represented in their real colours, but in white, or in black or grey tints, one of his impressions when completed resembling an aqua-tinta engraving. Although such tints as red, yellow, green, &c., are not reproduced, the degree of light and shade in which objects appear are preserved, but, as before stated, in white, black, or grey tints, varying in intensity.

M. Daguerre has submitted to M. Arago and two other members of the Academy of Sciences specimens of the impressions taken by his new process, being a view of the gallery which connects the Louvre and the Tuileries, one of that part of Paris called 'le Cité,' with the towers of Nôtre Dame, several views of the Seine and the bridges, and also of some of the barriers or gates of Paris. These specimens lose none of their excellence when examined through a magnifying glass, which would be the case with ordinary sketches. The time occupied in obtaining a fac-simile of any object, when considerable vigour of tone is required, varies according to the intensity of light, a longer time being required in winter than in summer, and in the afternoon than at mid-day. In summer, at noon, from eight to ten minutes is sufficient for the purpose; but under a clear and cloudless sky, such as that of Egypt, two or three minutes would suffice.

It has long been known that a surface formed of chloride of silver was capable of retaining, though in an imperfect manner, the impressions thrown upon it by the camera obscura. This substance is white, and the action of light discolours and renders it dark; therefore, on a surface composed of the chloride, those parts of an object which are light represent a corresponding form, but dark, while the dark portions of the object, on the contrary, are represented by the unchanged white. The impression remains, but the white parts becoming also discoloured, all distinction is lost, and consequently no lines are left. In the 'Journal of the Royal Institution' an account is given of some heliographic experiments made by Sir Humphry Davy and Mr. Wedgwood, but they had not been followed up with much perseverance, and were, on the whole, unsuccessful. The merit of M. Daguerre consists in having obtained a surface more sensible to the action of light than any before employed, and combined with this, possessing the advantage of retaining impressions, which may be exposed without undergoing any change, just in the same manner as a common drawing. So sensible is the surface on which impressions are received on M. Daguerre's prepared paper, that even the rays of the moon act upon it.

The nature of the composition which possesses such extreme optical sensibility, when once made known, will be rendered available to everybody, and an application is intended to be made to the French government to secure to M. Daguerre a sum of money for disclosing his secret, to which publicity will subsequently be given. It is said that the preparation by which he renders a surface so susceptible of the action of light is both inexpensive and easily made.

The originality, however, of M. Daguerre's claim to the invention has been disputed, and it is now asserted that he was indebted to a M. Niepce for the first idea of fixing the objects represented in a camera-obscura. The latter gentleman directed his attention to this subject in 1814, but he also borrowed the idea from another individual, M. Charles, a member of the Academy of Sciences, who is said to have been engaged in some helio-

graphic experiments about the same time as Sir Humphry Davy and Mr. Wedgwood. M. Niepce was in England in 1827, and having mentioned his discovery to Mr. Bauer, was advised to draw up a memoir for the Royal Society, containing some account of his experiments; but the paper was not read, owing to a rule which excludes subjects referring to processes which are not disclosed. This memoir is now in the possession of Mr. Bauer. In 1829 M. Niepce and M. Daguerre entered into partnership, with a view of improving and practising the process of heliography. On the death of M. Niepce, soon afterwards, M. Daguerre was left in possession of the field, and has since continued his exertions with great ardour and perseverance.

Besides the early efforts of Sir Humphry Davy and Mr. Wedgwood, several other individuals in England have, with various degrees of success, been engaged in elucidating the chemical phenomena on which the perfection of the heliographic process depends. In 1834 Mr. Fox Talbot began to practise a method which he had devised some time before for employing the chloride of silver. When paper is first washed with nitrate of silver, and then with common salt (chloride of sodium), chloride of silver is formed upon the paper, which is more sensible to light than the nitrate, and which becomes discoloured when exposed to violet rays of light. From a limited number of processes combined in various ways, Mr. Talbot soon produced a great variety of unanticipated effects. They were so numerous, that the means by which they were effected could not, in many cases, be followed; and they remain accidental and unexplained phenomena, which more extensive experience will enable the experimenter to seize upon and retain, to be produced at pleasure. Mr. Talbot's process renders coloured tints attainable; and sky-blue, yellow, rose-colour, brown of various shades, and black, have been reproduced in his fac-similes of objects; but green, excepting a very dark shade of this colour, escapes the attempts at reproduction. Flowers and leaves are rendered with such fidelity that the minute hairs which surround the plants are delineated, even those which are not visible except with a magnifying glass being fixed on the surface with wonderful accuracy. He has extended the process to delineations of sculpture, and even to the copying of drawings and engravings. When Mr. Talbot first commenced his experiments, he was not acquainted with the means of rendering impressions permanent; but in his endeavours to obtain a surface capable of retaining them, he discovered two different methods by which he could effect his object. In reading the account which he has given of his experiments, it is impossible not to be struck with the fertile field which the new art opens to chemical science.

It is not easy to foresee all the advantages of which heliography will be productive when it shall be widely known. It will be the means of enabling the naturalist to obtain the most accurate specimens; the traveller, to take the form and outline of interesting monuments; and will prove a source of interest and gratification generally. It will only be necessary to take a sheet of the prepared paper and throw the desired objects upon it by means of the camera, when a perfect fac-simile will remain; and as Mr. Talbot suggests, several cameræ may be simultaneously disposed at different points, and the collective results would be invaluable to the traveller or the naturalist wishing to obtain numerous memorials of the objects which interest him.

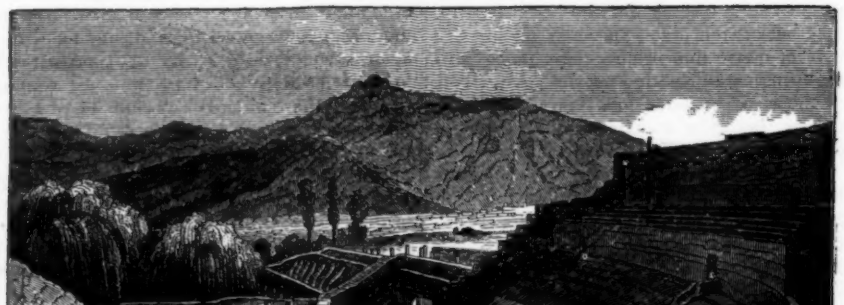
Perhaps one of the greatest advantages of the heliographic process will be found in its power of multiplying original designs or copies of drawings to any extent. Mr. Havell, the painter, and Mr. Fox Talbot have communicated to the 'Literary Gazette' the means by which this may be accomplished, and which seems to have been practised as an original invention by Mr. Wilmore, an engraver.

Mr. Fox Talbot's impressions resemble etchings on copper-plate, and he applied the heliographic process to their production more than five years ago. The method which he pursues is as follows:—"Take a sheet of glass and smear it over with a solution of resin in turpentine; when half dry, hold it over the smoke of a candle; the smoke will be absorbed by the resin, and although the glass will be darkened as usual, there will be a sort of glaze over the smoke, which will prevent it from rubbing off. Of course, if any opaque varnish be at hand, it will be simpler to use that. On this blackened surface, when not quite dry, let any design whatever be made with a needle's point, the lines of which will of course be transparent. When this is placed over a sheet of prepared paper, a very perfect copy is obtained; every line which the needle has traced being represented by a dark line upon the paper." Instead of a drawing, a circular letter may be written on the surface, and copies multiplied by heliography without resorting either to the lithographic, the copper-plate, or the common printing-press. From a subsequent communication, it appears that, transparent varnish of different colours being used, as many different shadowy tints are reproduced in the copy. "The blue colour gives a dark shade; the yellow, red, &c., various feebler ones. These variations produce an excellent effect, since every gradation of shade can be introduced at pleasure," the sharp black lines being given by cutting through the dark varnish with the needle.

Mr. Havell, in consequence of the disclosure of the process of heliography by Mr. Talbot, was led to apply the art to the multiplication of the works of the artist's pencil. After failing in the first instance, he succeeded by the following method:—"A square of thin glass was placed over the well-known etching, by Rembrandt, of 'Faust conjuring Mephistophiles to appear in the form of a bright Star;' I then painted on the high lights with thick white lead, mixed with copal varnish, and sugar of lead to make it dry quickly; for the half tints I made the whites less opaque with the varnish, and graduated the tints off into the glass for the deep shadows. I allowed this to dry, and the following day retouched the whole, by removing, with the point of a knife, the white ground, to represent the dark-etched lines of the original. The glass thus painted, when placed upon black paper, looked like a powerful mezzotinto engraving. I placed a sheet of prepared paper upon the painted surface; and, to make the contact perfect, put three layers of flannel at the back, and tied the whole down to a board. There happened to be a bright sun, and, in ten minutes, the parts of the glass exposed had made a deep purplish black on the paper." With some improvements which Mr. Havell adopted, the impressions "resemble a mezzotinto print or a rich sepia drawing."

Cultivation of the Vine.—In our own country it is suffered to expand itself to any size, and nailed in regular lines to the wall or frame of a greenhouse; thus, a single tree will produce several hundredweight of grapes. On the banks of the Rhine the growth is limited to four feet in height, and each tree is supported in an upright position. In France it is formed into arches and ornamental alcoves. [This is not generally the case.] In Sardinia it assumes the aspect of a parasitical plant, luxuriating among the branches of the largest forest-trees, and clasping with its tendrils the extreme twigs. In Asia Minor its wild festoons hang their green and purple pendants from rural bowers of trellis-work. On the heights of Lebanon it lies in a state of humiliation, covering the ground like the cucumber; and subsequently we saw it, in the valley of Eshcol, in a position different from all that have been named. There, three vines planted close together, and cut off at a height of five feet, meet in the apex of a cone formed by their stems; where, being tied, each is supported by two others, and thus enabled to sustain the prodigious clusters for which that region has always been famous.—*Rev. C. B. Elliott's Travels in Austria, Russia, Turkey, &c.*

GREEK DRAMA.



[View of the large Theatre at Pompeii.]

Next to the Iliad and Odyssey, the most precious remains of Greek poetry are the works of the dramatists. Never have stage exhibitions been cultivated with such critical judgment and passionate fondness, as by the Athenians in the time of their greatest splendour. Their drama was very unlike and inferior to the modern in variety and range of power; but as a splendid and elaborate specimen of art in its most extended sense—of the union of poetry, music, and the imitative arts into a harmonious whole—it has never been equalled. Of the innumerable treasures of the Attic stage, there remain perfect specimens of three tragedians only and one comedian: fortunately these four are the great masters of their art, and some of their most celebrated productions are comprised among the few yet extant. Their names, in the order of age, are Æschylus, Sophocles, Euripides, and (the comedian) Aristophanes. We intend, deferring the consideration of comedy, to give a brief account of the growth of the drama; the origin, construction, and rules of the Greek theatre; and the personal history, works, and distinctive qualities of the above-named tragedians. We may here, in the outset, acknowledge extensive obligations to a complete and useful compendium of the antiquities and history of the drama, entitled 'Theatre of the Greeks;' and to Schlegel's 'Lectures on Dramatic Literature;' the latter, in particular, has been our critical text-book and guide.

The drama in Greece, as indeed in modern Europe, had its origin in religion. Music, singing, and dancing, all rude in their kind, were the accompaniments of rustic festivals, held at appropriate seasons of the year in honour of different divinities; and especially at those joyful occasions when the bounty of the gods, revealed in the fruits of the earth, called for thanksgiving. The festivals of Bacchus, the patron and protector of vineyards, the inventor of wine, were likely to be more especially joyous; and accordingly, as far back as records go, we find sacrifices performed in honour of the god, at which hymns, both grave and mirthful, that mirth being of a rude, satirical, and licentious order, were sung by *choruses*, or bands of singers. As civilization advanced, more and more attention was paid to these celebrations; and as in the times when such pastimes were common in England, adjoining parishes may have striven for the victory in morris-dancing, so neighbouring towns or districts of Attica matched their bands of singers against each other, and rewarded the victors with some rustic prize; often a goat to be sacrificed, as an animal offensive to Bacchus, being especially injurious to the vine. Hence, according to the common derivation, comes the word *tragedia*, from the two words *tragos ode*, "the goat's song." About the year B.C. 525, a native of Attica, named Thespis, took the first step towards reducing these lyrical representations into the form of the drama. He broke their uniformity, and gave relief and novelty to the exhibition by reciting at intervals, from a raised stand (usually a waggon, the resource in all times of itinerant orators), tales of the national mythology. These were analogous to the recitations of the rhapsodists, concerning which we have formerly spoken in our life of Homer (No. 386), and, like them, were sure to be heard with interest. In the first instance therefore the reciter and the *chorus* (to use a word familiar to us in a meaning different from that technical one which we shall henceforth give to it) were disconnected, one serving as a foil to the other. It was a natural step to make the chorus testify an interest in the recitation by observations interchanged among themselves, or addressed to the reciter; and this was the germ of dialogue. On account of these and other less important steps, Thespis has obtained the credit of being the inventor of the drama. It was still, however, the drama in its rudest form. Phrynichus, the pupil of Thespis, who came before the public some five and twenty years after the appearance of his master, first polished and dignified the tone of these exhibitions, introduced graver subjects, and treated them in a more connected manner. He curtailed the part of the chorus, introduced more characters than one, represented females, and substituted something of a plot for mere narrative. In his earlier pieces, however, only one performer came on the stage at a time: *dialogue* was the invention of his great successor and contemporary Æschylus. The first exhibition of Phrynichus was in the year B.C. 511; the last recorded was B.C. 476. None of his pieces are extant, a circumstance much to be regretted in tracing the history of the drama; but there is reason to believe that in deep thought, powerful but exaggerated imagery, and sonorous involved diction, he resembled Æschylus.

That Phrynichus possessed considerable power over the feelings, may be inferred from the anecdote, that his tragedy, 'The Capture of Miletus,' threw the whole theatre into tears; and that in consequence the author was fined, and the representation of the piece forbidden.

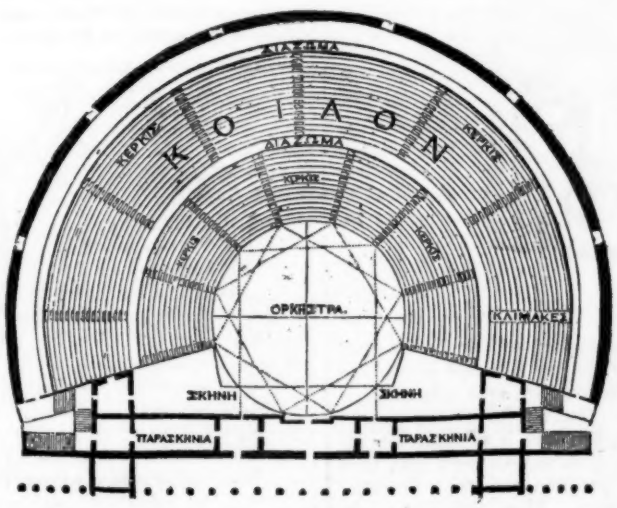
Æschylus, whose first appearance was in the year 499, abridged still more the length and prominence of the choral songs, and laid the keystone of the drama, by

bringing a second speaker upon the stage: the introduction of a third belongs to Sophocles, who finished, to the utmost perfection of art, the magnificent edifice which his predecessor left rough-hewn, but complete in its proportions and majestic dimensions. In Æschylus's extant pieces, distinguished as they are by marked peculiarities from those of his successors, we see fully developed the generic features of the Greek tragedy. These may be briefly summed up as follows. It did not admit more than three speakers at once, and ran more into set speeches, and less into natural and easy dialogue, than the English drama, very much to the exclusion of those sudden and striking effects which, in the vocabulary of our theatre, are called *points*. The action was single, that is, there was no second or under plot; the whole piece tended to one end. The time embraced was usually (not invariably) short, not exceeding a day. The scene usually was not changed in the course of the piece. These are the three unities of action, time, and place, concerning which so much has been written, especially by the French school of critics, who have required a far more strict and pedantic adherence to them than was observed by the Greeks themselves. A body named the chorus, whose origin has already been traced, bearing no analogy to anything in the modern drama, formed a sort of medium between the actors and the spectators, took little share in the action of the piece, and rather reflected upon what was going on than promoted the catastrophe. Instead of appearing on the stage, it remained in the orchestra (a term to be explained hereafter), at times joining in the dialogue, at times varying it by songs and dancing.

To the bold and teeming imagination of Æschylus, Greece owed not only the realization of tragedy in the abstract, but the investing it with fitting accessories for presentation to the eye; the invention of a worthy theatre, stage effect, dress, and decoration. He was indeed fortunate in living when the defeat of the Persian, and the rapid growth of Athens in power, pride, wealth, and luxury, placed resources at his command, such as his predecessors had never dreamed of. The first stone theatre was commenced at Athens under the superintendence of Themistocles, soon after the retreat of the Persians. Of its construction we have next to speak.

The Greek theatre was usually (always, we believe, when such a situation could be found) excavated in a sloping hill side. The object of this—economy of labour and expense—is evident from its form. The part appropriated to the audience (called ΚΟΙΛΟΝ, "the hollow") was bounded without and within by arcs, not less than semicircles, of concentric circles, between which, tier above tier, rose circular benches, elevated one above another, so as to afford to every one a clear view, divided into two or more flights by broad steps or landings (ΔΙΑΖΩΜΑ), and again subdivided into wedge-like compartments (ΚΕΡΚΙΣ) by stairs (ΚΛΙΜΑΚΕΣ) leading from the bottom to the top of the building. The extent of the structure was immense. The Athenian theatre, by some calculations, held 30,000 persons, from which it is computed that a person in the middle of the highest row must have been 300 feet from the front of the stage, and that the flat side of the theatre was not less than 400 feet. Within the inner circle of seats, answering in position to our *pit*, lay the *orchestra*, or dancing-place, sunk below the lowest seat about twelve feet; a level space devoted to the dances of the chorus, which however were performed only in that part of it which adjoined the stage: the remainder was kept scrupulously clear. In the middle of it was a square platform, called *thymele*, level with the stage, on which the leader of the chorus, when they were at rest, placed himself, to see and communicate with the persons on the stage: the rest of the chorus arranged themselves on the steps around it. The stage itself was broad and shallow, level with the lowest tier of seats: it was called in Greek *logeion* and *proskenion*. In one of the ruins yet remaining the breadth of the stage is said to be 250 feet, five times that in the theatre of San Carlos at Naples, the largest of modern Europe. Behind the stage rose (skenè), the *scene*, or background, the nature of which is rather obscure. It was however more solid and permanent than the canvas screens of our modern theatres, and its decorations usually were unchanged during the representation of a piece. The theatre was open to the sky, and the performances were in broad daylight. If a storm came on, the play was interrupted; an inconvenience, says Schlegel, which the Greeks were more willing to bear, than, "by shutting themselves up in a close, musty house, to do away with the cheerfulness of a national religious festival, such as in fact their theatrical performances were. To shut up the stage itself, and to incarcerate gods and heroes in dim chambers, would have seemed to them still more contradictory. An action which bore such glorious testimony to their affinity with heaven must also proceed beneath the free heaven, beneath the eyes, as it were, of the gods, for whom indeed, as Seneca says, the sight of a brave man striving with difficulties is a worthy spectacle."

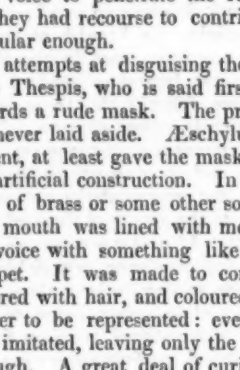
Such in its general form was the building. A more minute account will be found in the work on Pompeii,



[Plan of the Greek Theatre.]

'Library of Entertaining Knowledge,' from which the above ground-plan and the following particulars as to dress, &c. are chiefly derived. In tragedy the dramatis personæ were invariably taken from the mythic or heroic age, and from a class whom time and fable had invested with preternatural grandeur; men either the immediate offspring or the descendants of gods, and accustomed to see or converse with gods upon earth; capable alike of greatly daring or of greatly enduring, and exalted above the common run of human qualities both in mind and body. Everything therefore was to be great, but calm: the violent passions and stormy scenes which, in the hands of our own dramatists, produce such powerful effects, would not have found favour with an Athenian audience. The dialogue was regular and sustained, the speeches long and rhetorical, and good recitation was of more importance than good acting. The nature of the theatres contributed to produce this effect. In their huge area the expression of the face, the modulation of the voice, and all that we term bye-play, would have been lost to the larger part of the audience. With these, the greatest of an actor's merits, they were unacquainted: their object was to see and hear, not perfectly, but to see and hear; and to increase the splendour of the spectacle, and enable the voice to penetrate the remotest parts of the building, they had recourse to contrivances which to us appear singular enough.

The earliest attempts at disguising the actor's person are ascribed to Thespis, who is said first to have used paints, afterwards a rude mask. The practice of hiding the face was never laid aside. Æschylus, if he did not absolutely invent, at least gave the mask its life-like appearance and artificial construction. In the perfect state it was formed of brass or some other sonorous material, or at least the mouth was lined with metal, so as to reverberate the voice with something like the power of a speaking-trumpet. It was made to contain the whole head, was covered with hair, and coloured suitably to the age or character to be represented: even the whites of the eyes were imitated, leaving only the aperture of the iris to see through. A great deal of curious and minute information on this subject is preserved; but after all the best notion of the dramatic mask is to be had from the sculptured imitations in marble. These are from the



Townley Gallery. The male is remarkable for the great elevation of the hair (*onkos*), to give increased stature and dignity to the actor; its features are stern and exaggerated. Those of the female (but for the gaping mouth) are regular and beautiful, and bear a wild, intense, inspired expression of terror, such as Cassandra may have worn while presaging her own fate, and the evils about to fall on the house of Atreus. There were also masks peculiar to the comic and satiric drama: an example of

the latter, combined with a tragic mask, also from the Townley Gallery, is here given.

Thus enveloped, the heads of the actors must have appeared disproportionately large. To remedy this and raise their stature to the heroic standard, a thick-soled boot was invented, called *cothurnus*, a word which, with its translation, *buskin*, has become almost the distinctive mark of tragedy, as *sock* has of comedy. Many however, in reading or using the words sock and buskin in this sense, will not be aware that the reference is simply to the high-soled or low-soled shoe, which made the difference between the stature of heroes and that of men. Both the cothurnus and onkos are represented in the annexed outline of a painting at Pompeii. The proportion of the

[Tragic Scene.—From a Painting found at Pompeii.]

figure, thus increased in height, was preserved by stuffing and padding, so as to give the idea of superhuman

size and strength. How all this was consistent with anything like natural speech and action, it is not easy to imagine. Distance certainly at once rendered the increase of bulk more necessary, and softened the awkwardness of such made-up figures: still, in spite of the acknowledged purity of Greek taste, and of the art and splendour bestowed on their adornment, they must surely have seemed constrained and unnatural to any unaccustomed spectator.

The chorus, though less prominent than of old, was still an important part of the exhibition. The number was variable; most commonly, in tragedy, fifteen. It was stationed in the orchestra, joining in the dialogue through the *coryphæus*, or head-man. "Between the acts it poured out hymns of supplication or thanksgiving to the gods, or didactic odes of general application, but more or less interwoven with the business of the piece. While engaged in singing these strains to the accompaniment of the flute, the performers were also moving through dances in accordance with the measure of the music; passing during the *strophe* across the orchestra from right to left; during the *antistrophe* back, from left to right; and stopping, at the *epode*, in front of the spectators."* On this account the strophe and antistrophe were made to correspond line for line in music and metre; an arrangement which the reader may have observed in the English odes of Gray and others, where no reason but the imitation of the ancients exists for it. In the epode the poet was unfettered in the choice and arrangement of his metres.

In the Attic theatre the performances were not of daily occurrence; they retained a trace of their origin, inasmuch as they were confined to the festivals of Bacchus, which were three in number. They were the objects of resort and admiration to foreigners, and the utmost importance was attached to them by the Athenian public: they were placed under the superintendence of the most dignified magistrates; and the expenses, unsparingly bestowed, were defrayed by the state, or imposed on wealthy individuals. The whole day was usually occupied in celebrating them; for several poets usually contended for victory in the same day; and it was the practice, though not invariably, for each to produce three tragedies, connected in story, and forming, as it were, three acts of one great drama. This was called a *trilogy;* or if, as was frequent, a satiric piece was added by way of entertainment, a *tetralogy*—Greek words signifying *three-story* and *four-story*. The successful poet was rewarded with a garland of ivy, the favourite plant of the patron deity of the festival.

[To be continued.]

THE HISTORY OF A TEA-CUP.—No. IV.

[Concluded from No. 450.]

The finer kinds of porcelain are often embellished with paintings of such exquisite workmanship, that they may safely bear comparison with the finest miniature-paintings. Here the combined talents of the artist and of the chemist are called into requisition, as much perhaps as in any process that can be named.

This part of the subject has therefore engaged the attention both of manufacturers and of chemists, in order to lay down working rules for the guidance of the workman. Perhaps the most remarkable investigator of this subject was Bernard de Palissy, who, having accidentally seen an enamelled cup, instantly conceived the idea of endeavouring to make improvements in the art of applying colours to glass and porcelain (for the principle is much the same in both cases). He threw up his occupation of a land-surveyor, and devoted his time, his energy, and his means to the prosecution of his favourite subject. Years did he devote to it, and subjected himself to the expostulations of those most dear to him by the expenditure of his means. At one time, so completely was he impoverished, that he actually broke up his furniture and some of the wood-work of his house for the purpose of fuel to feed the furnace in which his experimental compositions were being heated; and he stripped himself of a portion of his clothing to serve the purpose of wages to a workman who made noisy application for his earnings. It is however gratifying to those who can appreciate such energy in the pursuit of scientific investigation, to know that Palissy was rewarded for his years of toil by success and honourable fame. From the time of Palissy to modern days, repeated improvements have been made in the choice of colours employed for painting porcelain, and in the modes of laying them on.

* 'Theatre of the Greeks,' p. 125.

The substances employed as colours are invariably oxides of metals, ground to an extremely fine powder, and mixed with volatile oil or with gum-water to a consistency which enables them to be laid on with ease. One of the reasons why the colours must be metallic oxides is, that if they were of organic origin, whether animal or vegetable, they could not bear, without decomposition, the intense heat of the enamelling furnace, into which the painted porcelain is placed.

The selection of these oxides for colouring materials is subject to the taste of the maker, as well as to his scientific skill, and is far too extensive a subject for us to enter upon here. We may merely mention that gold, iron, antimony, lead, uranium, tin, zinc, and copper are among the large variety of metals used for this purpose. In order to make these colouring substances adhere permanently to the porcelain, it is necessary to mix them with a flux which will both enable them to melt more easily and combine with the porcelain more perfectly. This flux is generally composed of powdered glass, calcined borax, and refined nitre, mixed in definite proportions, and reduced to an impalpable powder. The process of grinding is very important, both as regards the colouring substance and the flux. A strong box has fitted into it a block of quartz, which is hollowed out into a concave form. In this is placed a smaller block, with the under surface made to fit to the bowl; and the upper surface is perforated for the reception of an upright shaft, which serves as a handle. In this box the colour and the flux are ground together for several hours, until they are reduced to the finest particles. After they have been thus ground, they are then dried and put on a very smooth and hard stone, and ground with a little water or oil by means of a muller.

The painting is performed by means of small camel-hair pencils, as in miniature-painting. Some of the earlier specimens of porcelain were painted by men whose names have become the property of posterity. Works on porcelain are extant, said to be from the hand of Raffaelle, and the cabinets of the curious present specimens of British porcelain with designs executed by Sir J. Thornhill. We have seen an oval dish, containing a view on the Rhine by one of the Flemish masters of surpassing beauty.

The devices are painted on the articles according to patterns, and according to the colours chosen. If the articles be comparatively cheap, the painting is performed by girls, who have no difficulty in following a given easy pattern; but if the ornaments be elaborate, the exercise of taste is called for, and the talents of a more experienced person are required.

The Chinese have a remarkable way of painting porcelain vessels so that the colour shall only be visible when the vessel is full of liquid. The cup is made very thin, and, after having been baked, is painted on its inner surface. When dry, a thin film of porcelain earth, the same as the cup, is laid over the inside, and on this a varnish or glaze is laid. The outside is then ground away almost to the level of the painted figure, which then

receives a coating of varnish on the outside, so as to conceal the paint. When the vessel is filled with liquid, it acts as a kind of foil behind, and throws out the figures, which were before obscured.

The gilt ornaments, rings, edges, &c. of articles of porcelain, are produced in a way very similar to the coloured painting. A portion of leaf-gold is dissolved in aqua-regia (nitro-muriatic acid); by the application of heat the aqua-regia evaporates, and leaves the gold in the form of a fine powder at the bottom of the crucible. This powder is then mixed with gum-water to the consistence of a smooth liquid paint, which is laid on the vessel with a camel-hair pencil.

Suppose the tea-cup is to have the upper edge gilt, the workman employs a small horizontal wheel, the height of which may be adjusted at pleasure, by the leg which supports it being made to slide in and out of a tube, like what is called a telescope candlestick. The workman holds the stand firmly between his feet, fixes the cup to the revolving top, and give it a rotatory motion with his left hand. He rests his right arm on a table, and with a camel-hair pencil, dipped in the gold paint, draws the line steadily round the edge of the cup, the rest for his arm serving as a guide. Other gilt ornaments of a more fanciful character are laid on with the pencil, but without the rotatory apparatus.

These gilt ornaments are afterwards burnished by a neat process, which is generally performed by females. An agate or blood-stone burnisher, a piece of sheepskin, a little white-lead, and a little vinegar, are required by those who work at this part. So much care is required to avoid soiling the gold by the hand, that the workwoman holds both the cup and her burnisher by means of a clean linen cloth. The agate burnisher is applied lightly on the gold, following the direction of the lines, ornaments, &c.; it is never rubbed in cross directions, for fear of giving the gold an appearance of being scratched. After having been burnished for some time, the surface is cleaned with a little white-lead or vinegar. This being removed with a soft linen rag, the burnishing is recommenced, and continued until the gilding is brilliant in every part.

In some descriptions of porcelain gold is applied in the form of leaf, and made to adhere by means of japanners' gold-size. The gold-size is laid on with a pencil; and when it becomes in a clammy state, between wet and dry, the gold is applied and pressed on with cotton wool. The vessel is then put into an oven, by which the gold is burnt on.

There is a kind of pottery known as gold or silver *lustre-ware*. In this case the oxides of gold or silver are mixed with an essential oil, and brushed entirely over the vessel. The vessel then being placed in an oven, the heat dissipates the oxygen, and leaves the metals adhering to the porcelain, but with much less brilliancy than when laid on in the way above described.

We now approach the last portion of our subject, viz. the *glazing*, or the glassy covering which gives such beauty, cleanliness, and durability to porcelain or pottery vessels. It is necessary here to remark, that although the blue figures on common ware are painted or printed when the ware is in the state of biscuit, or unglazed, yet the more elaborate painting on porcelain is generally done after the process of glazing; so that the enamel colours, by being afterwards heated, blend and unite with the glaze on the porcelain: it is true the painted wares have again to be placed in an oven, but this process is quite independent of that of glazing. What constitutes the process of glazing we now proceed to describe.

The materials employed as glaze are subject to many variations, arising both from the different views taken by manufacturers as to what is the best mixture, and from the attempts to manage the process in the cheapest possible manner. A glaze for the commonest ware is composed of ground flint mixed with litharge, in the proportion of four parts of the former to ten of the latter. This mixture is very hurtful to the workman employed, in consequence of the lead contained in the litharge; but the anxiety for a cheap glaze occasions it to be still used. For superior specimens of porcelain numerous recipes for glaze have been given, each manufacturer professing to have one peculiar to his own pottery. As a general rule, however, we may say that ground flint forms one of the ingredients of most kinds of glaze.

When the proper materials have been agreed upon and selected, they are finely ground and mixed up with water to the consistence of cream. Into this cream, which is kept constantly stirred to prevent the solid particles from subsiding, the cup or other vessel is dipped. A thin coating of course attaches to the outside, while the inside is filled with the cream. This being emptied out, the cup is turned rapidly about to make the glaze flow equally to every part. The cup is then allowed to drain for a few seconds, and is laid by, ready for being placed in the oven. Another cup is then taken, dipped into the glaze, and heated in the same way as the last, and so on to any extent.

When a sufficient number of vessels are ready, they are arranged in seggars, similar to those before described, and without touching one another. The seggars are piled one upon another into *bungs*, and the oven is heated gradually. The degree of heat attained is not equal to that in the baking oven; but is of such an amount that the glaze becomes melted and flows smoothly over the surface of the cup, as a transparent sort of enamel. The heat of the oven is then lowered, and the vessels are withdrawn in a finished state.

There is a mode of glazing ware by means of common salt. It was formerly employed for pottery in general, but is at present principally confined to stone ware. This kind of ware is made almost exclusively at Lambeth, where the manufacture of it is carried on to a great extent. The stone ware is peculiarly compact and dense in its structure, so that it will hold water without absorption, even if unglazed. The Lambeth potters procure their clay from Devonshire and Dorsetshire, and their ground flints from Staffordshire. When the vessels are made, and while in the oven, salt is thrown in, and becomes decomposed by the heat: the alkali of the salt combines with the flint contained in the ware, and forms a coating of glass which envelops the whole surface. Some of the stone-ware vessels made at Lambeth will hold as much as sixty gallons, and are very useful in many chemical process.

We frequently see that tea-cups and other articles of pottery-ware which have been purchased from hawkers, or at "cheap shops," become covered with innumerable cracks in the course of time. These vessels are made of a cheap description of clay that will not bear a sufficient degree of baking, or are covered with a cheap glaze, which becomes cracked or "crazed," as it is technically termed, by the frequent action of hot-water. In process of time pieces of the glaze chip off, and afford us one among a long list of proofs, that what are termed "cheap" goods are not always such.

We have now finished our tea-cup, and must here end our brief epitome of an extensive subject which is well worthy of a more extended notice than we can bestow upon it in this place. As one example of the extent to which the British porcelain manufacture is carried, we may mention, that trifling as is the quantity of gold on any one piece of fancy porcelain, yet the value of the gold used for this purpose in one only of the pottery villages amounts to 35,000*l.* per annum.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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